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discussions of heredity and evolution. The book is worthy of a place beside DARWIN'S *Origin of species* and DEVRIES'S *Mutationstheorie*, and is certain to be rated as a classic example of the new spirit which has entered into biological investigation in the beginning of the twentieth century.—GEO. H. SHULL.

Outlines of bacteriology

The scope of a work on bacteriology by ELLIS³ is outlined in the following sentence of the Introduction: "This book is intended to serve as an introduction to bacteriology in all its branches, though more attention has been bestowed on that aspect of the subject which is of the most interest to students of technical and agricultural bacteriology."

Bearing the above introductory sentence in mind, the reviewer is the more impressed by the apparent "errors of omission and commission," the lack of facile expression, misstatements of fact, and in places the absence of a knowledge that denotes real intimacy with certain phases of the subject to be presented. And it is marvelous that the firm of Longmans, Green & Co., should have undertaken the publication of the volume.

Without touching upon numerous smaller mistakes and errors, attention may be drawn to the prominence given the author's views upon the supposed very general flagellation of the members of the Coccaceae (pp. 19, 20). It might be well to point out that those views are not yet by any means concurred in by many eminent authorities.

The crudity of the method recommended for the observation of the germination of spores (p. 32) is brought into relief when compared with the superior advantages afforded by the use of the hanging-drop, or the hanging agar-block on the warm stage.

In the light of the best American practice, the method advised for the handling of gelatin petri dish cultures is incomparably cumbersome and unnecessary (p. 47); while the strictures passed upon the use of agar under similar conditions are scarcely warrantable (p. 49).

In his discussion of the effect of the electric current upon bacterial life, it would seem that the author had not read far enough afield, else the statements made by Professor J. BEHRENS in LAFAR'S *Handbuch d. techn. Mykologie* (vol. I, sec. 99, p. 455) would have vastly modified his opinion.

Page 61 gives undue prominence to MELTZER'S ideas regarding the adverse action of moderate degrees of continuous vibration upon bacterial cells. It may be said that those views no longer carry weight.

In the chapter on sterilization (p. 85) are to be found the following remarkable statements in reference to the sterilization of the air of a room: "It may at once be stated that no gas is a disinfectant. . . . Obviously, therefore, if we wish

³ ELLIS, DAVID, *Outlines of bacteriology* (technical and agricultural). 8vo. pp. xii + 262. *figs.* 134. London: Longmans, Green & Co. 1909. 7s. 6d.

to purify a room, our only chance consists in spraying the walls, the floors, and the objects in the room with a reliable liquid disinfectant. This tends to purify the places from whence the air derives its supply of bacteria." The admirable work of CHICK on the action of disinfectants receives no comment, whereas MIQUEL's work, so long out of date, is given great prominence.

In the chapter on sewage and sewage disposal (p. 239) are to be found remarks that in this country at least would be deemed erroneous, improper, and inadvisable. For instance, who would willingly subscribe to the following: "There is great similarity between *Bac. typhosus* and *Bac. coli communis*, an organism which is very common in sewage, and which is strongly suspected of being the cause of epidemic diarrhea, though positive proof is still wanting"? Dr. ELLIS condemns the methods of killing off bacteria in sewage by antiseptics as "not practicable," whereas RIDEAL in his own country, and PHELPS and CARPENTER and others in the United States, have shown how valuable an agent is calcium hypochlorite in this direction.

In the section heading "Disposal without purification" (p. 247), discussing the disposal of the contents of cesspools, the author writes: "The other [insoluble] substances that in larger places usually find their way to the sewage drain are thrown broadcast on to any convenient spot, such as a roadside or a neighboring common. This method is efficient enough for very small places, though it must detract somewhat from the healthiness of village life." It is to be regretted that Dr. ELLIS puts himself on record as condoning such a practice; no matter under what conditions of life, the practice is sufficiently vile and unsanitary to be most strongly condemned.

It is very noticeable that no chapter on the biological methods of water purification found a place in the book, despite its importance to technical students.

One cannot turn over the pages of the book without remarking upon the inexcusable crudeness of some of the drawings, which actually mar what otherwise makes a most presentable volume.—NORMAN MACL. HARRIS.

Vegetable proteins

Another of the monographs on biochemistry edited by PLIMMER and HOPKINS has just appeared,⁴ and deals with vegetable proteins. It is hardly necessary to state to biological chemists or plant physiologists that no one can speak more authoritatively upon this topic than OSBORNE. Plant physiologists, of whom a fundamental knowledge in several accessory sciences is demanded, are sure to welcome a work of this kind. It shows directness and force that comes from the author, who is the greatest producer in the subject he is discussing. The bibliography consists of 608 citations.

A list of the chapter headings will give a good idea of the scope of the work: historical review; occurrence of proteins in different parts of plants and their

⁴ OSBORNE, THOMAS B., *The vegetable proteins*. 8vo. pp. xiii + 125. New York: Longmans, Green & Co. 1909.